BEA REGIONAL PROJECTIONS TO 2045

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Introduction

This publication presents projections of economic activity and population for 1998, 2000, 2005, 2010, 2015, 2025, and 2045 for the States, regions, and the United States. Specifically, projections of the following are presented:

- Population for three major age groups,
- Personal income by major component,
- Employment for 56 industrial groups,
- Gross state product for 56 industrial groups, and
- Earnings for 14 industrial groups.

In addition, it presents estimates of population, personal income, employment, and earnings for 1978, 1983, and 1993 and estimates of gross state product for 1978, 1983, and 1992.

This publication is the first of three volumes. The second volume will present projections for metropolitan statistical areas, and the third will present projections for BEA economic areas; both these volumes will be published in 1996.

The regional projections program originated in 1964 under an agreement with the Water Resources Council. Upon enactment of the Water Resources Planning Act of 1965, the regional projections program became an integral part of a comprehensive water resources planning program and of periodic national assessments of water and related land resources.

The projections are used by Federal, State, and local government agencies and by various private organizations. The projections are mainly used (1) to assess future demand for goods and services by households, businesses, and government, (2) to analyze economic trends to anticipate future economic problems, and (3) to provide baselines with which to compare policy forecasts in the estimation of the effects of policies.

The projections are based on the assumption that past economic relationships will continue and that there will be no major policy changes. The projections are neither goals for, nor limits on, future economic activity in any region or State. Further, they are not an assessment of the probable success or failure of any regional development program established by, or proposed for, a State.

The judgments of reviewers knowledgeable about regional economic and demographic trends shaped the projections at each stage of the preparation; the projections of all variables were carefully reviewed for reasonableness and consistency. The national projections of population are consistent with those of the Bureau of the Census, and the national projections of the labor force are consistent with those of the Bureau of Labor Statistics.

Methods Used to Prepare the Projections

The methodology used to prepare the projections presented in this volume is similar to that presented in the volume published in 1990.[1] In particular, projections from 1995 to 2000 were derived from an annual econometric model, and these midterm projections were used to evaluate the projections for the first year of the long-term projections, which in this case, are the projections for 2000. A new element is the linking of the midterm and long-term projections for 2000 through the use of estimated State nonaccelerating inflation rates of unemployment (NAIRU's).[2] Linking the projections ensured that the projections for 2000 were in "full-employment equilibrium," consistent with the successive annual economic interactions of all projected variables in the midterm period; it also ensured that the projections for 2000 were on the long-term growth path that was determined by the projection to 2045 of historical trends in economic relationships among variables.

The projections were prepared in two major steps. First, national projections for 2000, 2005, 2010, 2015, 2025, and 2045 were prepared. The projections of personal income and earnings were mainly based on the projections of gross domestic product (GDP).[3] The GDP projections were based on projections of population, labor force, employment, and GDP per job.[4] The projections of GDP and of GDP per job were used as control totals for the national projections of GDP by industry; the national projections of GDP by industry were then used as control totals for the State projections of gross state product (GSP) by industry.[5]

The national midterm projections from 1995 to 2000 of population, personal income, employment, GSP, and earnings were derived from the sum of the econometric projections for the States. These econometric projections are the national projections for 1998, and they were used to modify the national long-term projections for 2000.

In the second major step, the national projections were used as the framework for the State projections of population, personal income, employment, GSP, and earnings. The State long-term projections were partly based on the historical economic relationships between each State's basic industries that mainly serve national markets and its nonbasic industries that mainly serve local markets. State midterm projections from 1995 to 2000 were derived from the econometric model; these econometric projections are the State projections for 1998, and they were used to modify the State long-term projections for 2000. The State midterm and long-term projections were then evaluated by the regional projections team and by representatives of the State government agencies that participate in the Federal-State Cooperative Program for Population Projections.

Methodology for the National Projections

The discussion of the national projections methodology is in two parts. The first part discusses the preparation of the midterm projections from 1995 to 2000. The second part discusses the preparation of the long-term projections for 2000, 2005, 2010, 2015, 2025, and 2045.

Midterm Projections

National midterm projections were derived from the regional econometric model—the National-Regional Impact Evaluation System (NRIES II).[6] The model uses two methods. In one method, the variables for a State

1. U.S. Department of Commerce, Bureau of Economic Analysis, *BEA Regional Projections to 2040, Volume 1: States* (Washington, DC: U.S. Government Printing Office, 1990).

2. See appendix A for a discussion of the NAIRU's.

3. Earnings is the sum of three components of personal income—wage and salary disbursements, other labor income, and proprietors' income.

4. GDP per job is GDP divided by employment on a job-count basis.

5. For all industries except the Federal Government, GSP by industry for all the States equals GDP by industry. For the Federal Government, the product of Federal civilian and military personnel stationed abroad, which is measured by the compensation of these personnel, is included in GDP but not in GSP.

For a more detailed presentation of the relationship between GDP and GSP, see Richard M. Beemiller, "Gross State Product, 1991–92," SURVEY OF CURRENT BUSINESS 75 (May 1995): 51.

6. For information about the model, see C.T. Lienesch and John R. Kort, "The NRIES II Multiregional Macroeconomic Model of the United States," *International Regional Science Review* 14, No. 3 (1992): 255–74. When the econometric model is used to prepare the midterm projections, the complex economic and demographic interrelationships at the State level can be considered. For example, the midterm projections reflect the effects of industrial growth in one State on the economy of every other State.

that differ significantly among States (such as employment) are projected in a model for the State. These variables for each State then are summed to obtain "bottom-up" national projections. In the other method, the variables for a State that differ little among States (such as prices and interest rates) are projected in a national model and are referred to as "top-down" national projections. The advantage of this hybrid bottom-up/top-down construct is flexibility; for some variables, the State projections determine the national projections, and for other variables, the national projections determine the State projections.

The national projections of population, personal income, employment, GSP, and earnings were calculated as the sum of the State projections. The State projections were modified to ensure that the national projections of population for 2000 were consistent with the national population projections from the Bureau of the Census and that the national projections of the labor force for 2000 were consistent with the national labor-force projections from the Bureau of Labor Statistics (BLS).[7] The State projections were also modified to be consistent with the assumption in the long-term projections that the national and State economies will be at, or near, their NAIRU's in 2000. In order to be consistent with this assumption, a set of State full-employment unemployment rates was derived from the NAIRU projected for the Nation by the Congressional Budget Office (CBO).[8]

Long-Term Projections

The projections of personal income and earnings were mainly derived from projected GDP. The projections of GDP were derived from projections of population, labor force, employment, and GDP per job. The projections of employment and of GDP for 56 industries and the projections of earnings for 14 industries were prepared; these projections by industry were adjusted to be consistent with the projected totals for employment, GDP, and earnings. The following table and chart show historical and projected GDP, population, employment, personal income, and earnings.

Population, employment, GDP per job, and GDP

The projections of GDP were derived from projections of a succession of labor-force variables. These variables included the civilian adult noninstitutional population, the civilian labor force, the number of military personnel, and the number of jobs held by the employed labor force. The projected number of jobs was multiplied by projected GDP per job to obtain projected GDP.

The civilian adult noninstitutional population includes all participants in the civilian labor force. The projections of this population group were derived by BLS from the Census Bureau's national population projections by age, because growth in the labor force depends primarily on the growth in this population group. The national projections of population by age are from the Census Bureau's middle series of national projections.[9]

7. When "bottom-up" national projections are modified, the modifications must be made to each State model.

8. See appendix A.

9. U.S. Department of Commerce, Bureau of the Census, "Population Projections of the United States, by Age, Sex, Race, and Hispanic Origin: 1993 to 2050," *Current Population Reports*, Ser. P-25, No. 1104 (Washington, DC: U.S. Government Printing Office, 1993).

Summary of Selected Totals for the United States

	Thousands			Billions of 1987 dollars						1987 dollars
	Total population [1]	Employment (persons)	Employment (jobs)	Gross domestic product	Total earnings	Less: personal contributions for social insurance	Dividends, interest, and rent	Transfer payments	Total personal income [2]	Per capita personal income
Historical:										
1978	222,397	96,049	109,608	3,703.5	2,294.5	114.5	391.4	399.1	2,969.8	13,354
1983	233,790	100,833	115,730	3,906.6	2,353.1	137.5	573.7	507.4	3,296.1	14,099
1993	257,783	119,306	140,617	5,134.5	3,017.5	203.5	658.4	712.2	4,183.9	16,230
Projected:										
1998	270,721	129,278	153,134	[3] 5,794.5	3,391.1	230.7	760.4	778.0	4,698.6	17,356
2000	276,241	133,328	157,656	6,036.4	3,532.7	241.1	799.6	803.3	4,894.5	17,718
2005	288,286	141,785	167,817	6,646.9	3,878.4	265.4	900.7	892.2	5,405.9	18,752
2010	300,431	148,635	176,164	7,232.4	4,207.5	299.7	1,001.7	1,007.7	5,917.2	19,696
2015	313,116	153,585	182,191	7,768.4	4,505.9	352.0	1,098.7	1,171.6	6,424.2	20,517
2025	338,338	158,451	188,329	8,739.3	5,039.0	494.0	1,284.6	1,614.9	7,444.5	22,003
2045	381,779	175,488	208,789	11,475.9	6,538.6	712.7	1,799.6	2,360.7	9,986.2	26,157

1. Total population excludes military personnel stationed abroad.
2. Total personal income for 1978, 1983, and 1993 includes a minor residence adjustment to the earnings component. The projection of this adjustment is zero for all years except 1998.
3. This entry is the sum of gross state product for all States.

The civilian labor force consists of the number of employed and unemployed persons. The projections of the civilian labor force were calculated as the projections of the civilian adult noninstitutional population multiplied by the projections of the labor-force-participation rates of this population group. The projected rates for 2000 and 2005 were adapted from BLS projections; BLS projected the rates for the years beyond 2005 to be constant at the 2005 levels.[10] For the selected years in 2005–45, BEA's projected rates were based on dampened extrapolations of the rates of change in the participation rates projected by BLS for 1995–2005.

The projections of the number of unemployed persons were calculated as the projections of the civilian labor force multiplied by projections of full-employment unemployment rates. The national rate was projected to be 6.0 percent in 2000—consistent with the CBO-projected NAIRU. The rate was projected to fall to 5.5 percent by 2015 and to remain at 5.5 percent through 2045.

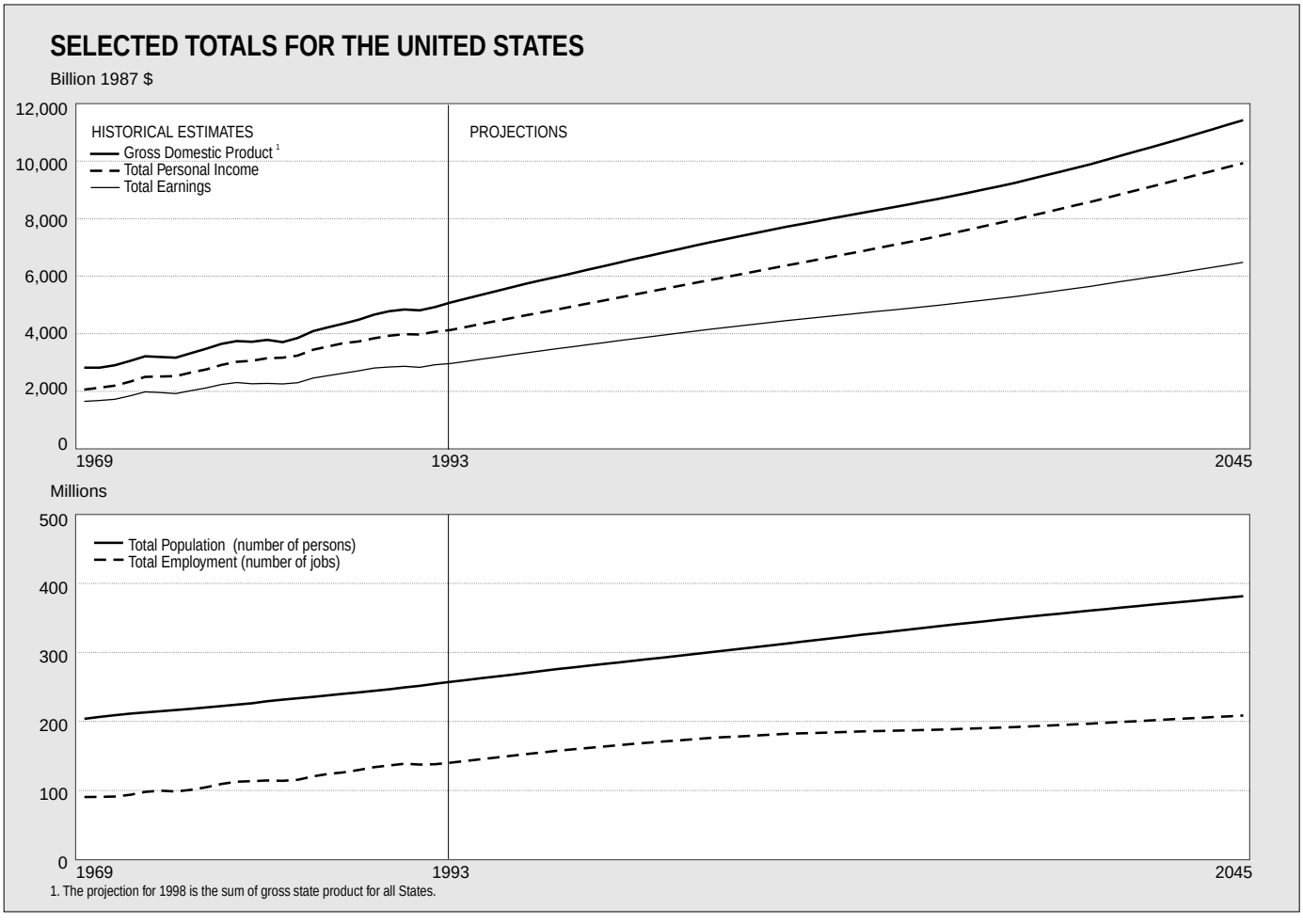
The projections of the number of employed persons were calculated as the civilian labor force minus the number of unemployed. The projections of total employment were calculated as the projected number of employed plus the projected number of military personnel.[11]

The national projections of total employment are on a persons-working basis. Employment on a persons-working basis counts an employed person only once, although the person may hold more than one job. However, in the State employment series, the estimates are on the basis of the number of jobs by industry. Because the concepts underlying the national and State projections must be the same, the projected national employment aggregates were adjusted to conform to the State estimates on the basis of job counts.

The civilian job-count estimates exceed the civilian persons-working estimates by 15.8 percent in 1993, and the margin was projected to grow to 17.6 percent by 2045. The 1993 margin is the sum of three factors: (1)

10. Howard N Fullerton, Jr., "Another Look at the Labor Force," in *The American Work Force: 1992–2005*, Bureau of Labor Statistics Bulletin 2452 (Washington, DC: U.S. Government Printing Office, 1994): 29–38.

11. BEA projected the number of military personnel to decline to 2.4 million in 2000 and to remain constant thereafter.



The rate of multiple jobholding, at about 3.0 percent, (2) the estimated number of jobs associated with income misreported on tax returns, at about 2.0 percent, and (3) other conceptual differences, mainly reflecting different methods of counting the self-employed, at about 11.0 percent.

Projected total employment was multiplied by projected GDP per job to obtain projected total GDP. Total GDP per job was projected to grow 0.68 percent per year until 2005.[12] The growth rate was projected to increase gradually, reaching 0.85 percent per year by 2020 and then holding constant to 2045.

Total personal income

Total personal income is calculated as the sum of earnings by place of work less personal contributions for social insurance, a residence adjustment, transfer payments, personal dividend income, personal interest income, and rental income of persons.[13] The national projection of total personal income is calculated as the sum of the national projections of the components.

The projections of earnings were based on the historical trend in the share of GDP accounted for by earnings, which is the largest component of GDP. Earnings as a share of GDP was projected to decline slightly, consistent with the historical trend. During the past two decades, this share has declined by 3 percentage points to 58.8 percent in 1993; this trend indicates that earnings per job has not kept pace historically with GDP per job. The assumption that this share will continue to decline is equivalent to the assumption that earnings per job will grow more slowly than GDP per job.

Personal contributions for social insurance as a share of earnings mainly depends on the size of the population group that is aged 65 and over. The share of these contributions was projected to increase proportionately with the projected increase in the share of the total population accounted for by this group. Personal contributions were projected to account for 10.9 percent of earnings in 2045, up from 6.7 percent in 1993.

The national residence adjustment that is made to net earnings was projected to be zero throughout the projections period. The projection of zero implies that all earnings in the United States will be received by U.S. residents; historically, the net outflow of earnings to persons living outside the United States has been negligible.

Transfer payments were projected in two parts: (1) The transfer payments made under the old-age, survivors, disability, and health insurance (OASDHI) programs and government employee retirement programs and (2) the other transfer payments that are made under all the other social insurance programs, including unemployment compensation. The other transfer payments, the smallest of the two parts, were projected on the basis of the historical trend in the ratio of these payments per capita to earnings per job. These payments were projected to account for 9.6 percent of earnings in 2045, up from 8.7 percent in 1993.

Transfer payments made under OASDHI and government employee retirement programs are mainly payments to persons aged 65 and over. These payments per person aged 65 and over were projected to increase proportionately with the projected increase in per capita personal income. Until recently, these payments per person aged 65 and over increased much faster than per capita income. In 1970, these payments per person aged 65 and over were less than 65 percent of the level of per capita income; this ratio increased to 77 percent in 1979, reached a peak of 86 percent in 1983, declined to 78 percent in 1989, and has risen since. This ratio was projected to remain constant at 85 percent through 2045.

Personal dividend income plus rental income of persons was projected to be 2.9 percent of GDP throughout the projections period.

Personal interest income as a share of GDP has grown steadily for several decades. The share grew from 8.2 percent of GDP in 1978 to 11.4 percent in 1988, but it has declined in recent years as a result of lower interest rates. Assuming that interest rates will resume their trend levels, the share was projected to grow, at a dampened rate, to 12.4 percent in 2010 and to 13.0 percent in 2045.

Employment, GDP, and earnings by industry

Employment and GDP were projected for 56 industries, and earnings were projected for 14 industries. The projections of employment were prepared in two steps. First, each industry's share of the total number of jobs was projected on the basis of rates of change in the BLS projections of these shares to 2005 and on the basis of slower rates of change thereafter.[14] Second, these

12. This rate is compatible with the growth rate of GDP per employee projected by BLS.

13. In the estimation of personal income, earnings less personal contributions for social insurance is assigned by place of work, which is the State in which the income recipient works, and the other components of personal income are assigned by place of residence, which is the State in which the recipient resides. To put the estimates of all the components of personal income on a place-of-residence basis, earnings less personal contributions for social insurance is adjusted so that this component is on a place-of-residence basis.

14. James C. Franklin, "Industry Output and Employment," in *The American Work Force: 1992–2005*, Bureau of Labor Statistics Bulletin 2452 (Washington, DC: U.S. Government Printing Office, 1994): 39–55.

projected shares were multiplied by the projected total employment to yield the projected employment by industry.

The projections of GDP were prepared in three steps. First, the ratio of GDP per job by industry to GDP per job for all industries was projected on the basis of historical trends in the ratio. Second, this projected ratio was multiplied by the projected GDP per job for all industries to yield the projected GDP per job by industry. Third the projected GDP per job by industry was multiplied by the projected employment by industry to yield the projected GDP by industry.

The projections of earnings were also prepared in three steps. First, the ratio of earnings per job by industry to earnings per job for all industries was projected on the basis of historical trends in the ratio. Second, this projected ratio was multiplied by the projected earnings per job for all industries to yield the projected earnings per job by industry. Third, the projected earnings per job by industry was multiplied by the projected employment by industry to yield the projected earnings by industry. The projections for the mining industries were modified on the basis of projections from the Department of Energy.[15]

Methodology for the State Projections

The discussion of the State projections methodology is in two parts. The first part discusses the annual State midterm projections from 1995 to 2000; these econometric projections are the State projections for 1998, and they were used to modify the State long-term projections for 2000. The second part discusses the State long-term projections.

Midterm Projections

The annual State midterm projections were derived from the regional econometric model—NRIES II. The model contains a model for each of the 50 States, a model for the District of Columbia, and a national model; it also contains a set of trade indexes for each State that reflect the effects of industrial growth in each State on the economies of every other State.

The structure of a typical State model is summarized in equation (1). In the equation, j denotes the State; X denotes the economic or demographic variables determined in the State model; Z denotes the exogenous variables, such as the minimum wage; Q denotes the variables determined in the national model, the sum of variables for all States, or the variables that measure interstate activities; U denotes the error term; and A, B, and C denote estimates of State-specific coefficients.

$$X_j = A_j X_j + B_j Z_j + C_j Q_j + U_j \quad (1)$$

In each State model, projections of population, personal income, employment, GSP, and earnings were prepared on the basis of economic and demographic relationships for each State and between each State and the Nation. For example, employment in a State affects population and vice versa, and employment in a State affects employment in all other States and in the Nation.

The State midterm projections for 2000 were modified to be consistent with CBO's projected national NAIRU of 6.0 percent and thus with the unemployment rate used in the long-term projections for 2000. The modification required the estimation of "target" State NAIRU's, the weighted average of which was 6.0 percent, and the production of a complete set of State midterm projections from 1995 to 2000 that were constrained so that the projected unemployment rates differed by no more than 0.2 percentage point from the target NAIRU's.[16]

Using the target State NAIRU's to link the midterm and the long-term projections takes advantage of the econometric model's relationships between labor demand and labor supply. In order to be consistent with the target NAIRU's, the levels of labor-demand variables, such as employment by industry, and of labor-supply variables, such as the working-age population, for each State and for the Nation for 2000 must be consistent with the full-employment equilibrium values of these variables for every State and the Nation. When the State long-term projections of employment by industry for 2000 differed from the State midterm projections for 2000, the long-term projections were modified in order to be consistent with the full-employment equilibrium values. Because the State long-term projections of employment by industry are the basis for the State long-term projections of GSP and of earnings by industry, these modifications ensured that the long-term and midterm projections were consistent for all industrially detailed variables at the State level.

Long-Term Projections

State long-term projections for 2000, 2005, 2010, 2015, 2025, and 2045 were prepared for employment by industry, GSP by industry, and earnings by industry, for population by three major groups, and for personal income by component.

15. See U.S. Department of Energy, Energy Information Administration, *Annual Energy Outlook 1994 With Projections to 2010* (Washington, DC: U.S. Government Printing Office, 1994).

16. See appendix A.

Employment by industry

The projection of employment for 56 industries in each State varied, depending on whether the industry was classified as a "basic" industry or as a "nonbasic" industry. In this section, the concepts of basic- and nonbasic-industry groups are defined, and then the projection methods used for each group are discussed.[17]

A basic industry is defined as an industry that produces outputs that are exportable from a State, such as motor vehicles, and that have a national market. Therefore, it is assumed that each basic industry in each State competes for a share of the national market.

Accordingly, in each State, employment in each basic industry was projected on the basis of the historical trend in the State's share of employment in that industry nationally. The projections are based on the assumption that the factors that affected the State's employment share in the past (for example, relative wage rates and access to inputs and markets) will continue to affect it, but less strongly, in the future, so that the rate of change in employment share will slow. This assumption ensures that no industry in a State will have an unreasonably large or small share of national employment in the industry at the end of the projection period.

A nonbasic industry is defined as an industry that produces outputs that generally satisfy only local demand. It is assumed that employment in each nonbasic industry in each State is determined by the level of local demand and that the level of local demand depends on the overall size of the economic base. Thus, in each State, employment in all nonbasic industries was determined by the share of the national market that was accounted for by the State's basic industries.

The projections of employment in each nonbasic industry were tied to basic-industry employment by the nonbasic-industry location quotient. The projections of the location quotient for an industry were based on historical trends for the industry. In many cases, the result was convergence toward unity; the convergence is consistent with the assumption that the long-term contribution of nonbasic industries to State economies varies little. In the cases in which a location quotient historically diverged from unity, the historical trend generally was dampened or reversed in the projection period.

The calculation of total employment for each State is summarized in equations (2) to (9). In the equations, E denotes the absolute level of employment, the subscript i refers to an industry, the subscript j refers to a State, and the subscript US refers to the Nation.

17. For information about the classification of these industries, see appendix B.

In equation (2), State total employment is calculated as the sum of employment in both basic and nonbasic industries.

$$E_j = E_{basic} + E_{nonbasic} \tag{2}$$

In equation (3), employment in each basic industry in the State is calculated as the State's projected share of national employment in the industry multiplied by the projected national employment in the industry.

$$E_{i,basic} = \frac{E_{ij}}{E_{iUS}}(E_{iUS}) \tag{3}$$

In equation (4), the location quotient for each nonbasic industry in the State is calculated as the ratio of the nonbasic industry's share of State total employment to that industry's share of national total employment.

$$LQ_{ij} = \frac{\frac{E_{ij}}{E_j}}{\frac{E_{iUS}}{E_{US}}} \tag{4}$$

In equation (5), employment in each nonbasic industry in the State is calculated as State total employment multiplied by the share of State total employment accounted for by each nonbasic industry.

$$E_{i,nonbasic} = E_j(LQ_{ij})(\frac{E_{iUS}}{E_{US}}) \tag{5}$$

In equation (6), the sum of employment for all nonbasic industries in the State is calculated as State total employment multiplied by the share of State total employment accounted for by all nonbasic industries.

$$E_{nonbasic} = E_j(\sum_i LQ_{ij}\frac{E_{iUS}}{E_{US}}) \tag{6}$$

In equation (7), the sum of employment for all nonbasic industries in the State is substituted for $E_{nonbasic}$ in equation (2).

$$E_j = E_{basic} + E_j(\sum_i LQ_{ij}\frac{E_{iUS}}{E_{US}}) \tag{7}$$

In equation (8), the share of State total employment accounted for by all nonbasic industries is expressed as M_j.

$$E_j = E_{basic} + E_j(M_j) \tag{8}$$

Dividing both sides of equation (8) by E_j, transposing the terms, inverting the terms, and multiplying both sides by E_{basic} yields:

$$E_j = \frac{1}{1 - M_j}(E_{basic}) \tag{9}$$

In order to obtain State total employment, the "economic base multiplier," the first term on the right of equation (9), is multiplied by projected basic-industry employment. State total employment from equation (9) is then used to compute employment for each nonbasic industry in equation (5).

GSP by industry

The projections of GSP for 56 industries were prepared in three steps. First, the ratio of GSP per job in an industry in a State to national GSP per job in the industry was projected on the basis of historical trends in the ratio. Second, this projected ratio was multiplied by the projected national GSP per job in the industry to yield the projected State GSP per job. Third, the projected State GSP per job was multiplied by the projected State employment to yield the projected State GSP in the industry.

Earnings by industry

The projections of earnings for 14 industries were also prepared in three steps. First, the ratio of earnings per job in an industry in a State to national earnings per job in the industry was projected on the basis of historical trends in the ratio. Second, this projected ratio was multiplied by the projected national earnings per job in the industry to yield the projected State earnings per job. Third, the projected State earnings per job was multiplied by the projected State employment to yield the projected State earnings in the industry.

Population

The projections of State population are based on the assumption that the interstate migration of the working-age population is mainly determined by economic opportunity; employment was used as the indicator of economic opportunity. The population for three major groups was projected: Labor pool (ages 18–64), prelabor pool (ages 17 and under), and postlabor pool (ages 65 and over).

The labor-pool population for each State was projected in three steps. First, the ratio of the labor-pool population to employment for the State, as a percentage of the ratio of the labor-pool population to employment for the Nation, was projected on the basis of historical trends in the percentage. Second, this projected percentage was multiplied by the projected national ratio to yield the projected ratio for the State. Third, this projected ratio for the State was multiplied by the projected State employment to yield the projected labor-pool population for the State.

The prelabor-pool population for each State was also projected in three steps. First, the ratio of the prelabor-pool population to the labor-pool population for the State, as a percentage of the ratio of the prelabor-pool population to the labor-pool population for the Nation, was projected on the basis of historical trends in the percentage. Second, this projected percentage was multiplied by the projected national ratio to yield the projected ratio for the State. Third, this projected ratio for the State was multiplied by the projected State labor-pool population to yield the projected prelabor-pool population for the State.

The growth in the postlabor-pool population in a State is becoming increasingly independent of the economic growth in the State. Thus, the share of the Nation's postlabor-pool population in each State was projected on the basis of dampened historical rates of change in the share. This projected share was multiplied by the projected national postlabor-pool population to yield the projected postlabor-pool population for the State.

Total personal income

Total personal income is the income received by the residents of a State from all sources. The projections of total personal income were calculated as follows:

Gross earnings by place of work	
Less:	Personal contributions for social insurance by place of work
Equals:	Earnings net of contributions by place of work
Plus:	Residence adjustment for interstate commuting
Equals:	Net earnings by place of residence
Plus:	Property income by place of residence
Plus:	Transfer payments by place of residence
Equals:	Total personal income by place of residence

The projections of total personal income were prepared in two parts—the earnings components and the nonearnings components.[18] The nonearnings components of personal income are personal contributions for social insurance, residence adjustment, property income, and transfer payments. The projections of some of these components depend on the population projections.

Personal contributions for social insurance.—This component is deducted from earnings according to the scheduled rates of withholding. Therefore, the State

18. For the methods used to project the earnings components of personal income, see the section "Earnings by industry."

projections of contributions were developed from projected place-of-work earnings in three steps. First, the ratio of the contributions to earnings in the State, as a percentage of the ratio of contributions to earnings for the Nation, was projected on the basis of historical trends in the percentage. Second, this projected percentage was multiplied by the projected national ratio to yield the projected ratio for the State. Third, this projected ratio for the State was multiplied by the projected earnings in the State to yield the projected contributions in the State.

Residence adjustment for interstate commuting.—Net earnings are adjusted to account for the effect of interstate commuting on the personal income of a State. A positive residence adjustment indicates that interstate commuting results in a net inflow of income to a State, and a negative adjustment indicates that interstate commuting results in a net outflow of income from a State.

The residence adjustment for each State was projected in two steps. First, the ratio of net earnings by place of residence to net earnings by place of work was projected on the basis of the historical trend in the ratio. Second, this projected ratio was multiplied by the projected net earnings by place of work to yield the projected net earnings by place of residence.

Property income.—Property income consists of personal dividend income, personal interest income, and rental income of persons. Property income is difficult to project because it accrues to the owners of the factors of production, who do not necessarily reside in the State in which the related economic activity occurs.

Property income for each State was projected in three steps. First, the ratio of property income per capita in the State to national property income per capita was projected on the basis of historical trends in the ratio. Second, this projected ratio was multiplied by the projected property income per capita in the Nation to yield the projected property income per capita in the State. Third, this projected product was multiplied by the projected total population in the State to yield the projected property income in the State.

Transfer payments.—Transfer payments for each State were also projected in three steps. First, the ratio of transfer payments per capita in the State to national transfer payments per capita was projected on the basis of historical trends in the ratio. Second, this projected ratio was multiplied by the projected transfer payments per capita in the Nation to yield the projected transfer payments per capita in the State. Third, this projected product was multiplied by the projected total population in the State to yield the projected transfer payments in the State.

Appendix A

Unemployment-Rate Projections

The national econometric projections for 2000 were modified to be consistent with the projection by the Congressional Budget Office (CBO) of the Nation's nonaccelerating inflation rate of unemployment (NAIRU), which is a projection of the full-employment unemployment rate.[1] The estimation of the historical NAIRU required the statistical estimation of equations for the Phillips curve, which charts the inverse relationship between the unemployment rate and the inflation rate. The CBO estimated a modified version of the Phillips curve because of a breakdown of the inverse relationship in the 1970's, when the U.S. economy had both high unemployment and high inflation. This modified, or "expectations-augmented," Phillips curve tries to capture the effects of supply shocks and the process by which markets form expectations of future inflation, while it preserves the inverse relationship between unemployment and inflation.

Using the modified Phillips curve, CBO estimated an aggregate NAIRU as a (labor-force) weighted average of NAIRU's by sex and age. CBO projected the aggregate NAIRU on the basis of labor-force projections by sex and age.

The State econometric projections for 2000 were modified to be consistent with the CBO projection of a 6-percent NAIRU for the Nation and with a weighted average of 6 percent for the States (in the econometric model, the Nation's unemployment rate is a weighted average of the State rates). The projections were modified in two steps. First, "target" NAIRU's were set for the year 2000. The basis for the target NAIRU's for 2000 was the State NAIRU's estimated for 1990, which were chosen because the U.S. unemployment rate for 1990 (at 5.5 percent) was reasonably close to the CBO-estimated NAIRU for 1990 (at 5.9 percent) and because it is assumed that State economies are at, or near, their full-employment NAIRU's only when the U.S. economy is also at full employment. The State NAIRU's for 1990 were estimated from pro rata (labor-force) adjustments to observed unemployment rates so that the weighted average of the adjusted rates was 5.9 percent. The target State NAIRU's for 2000 were adjusted until their weighted average equaled the CBO projection of a 6-percent NAIRU for the Nation.

Second, a complete set of econometric projections from 1995 to 2000 was prepared; these projections were constrained by the requirement that the projected unemployment rates for 2000 differ by no more than 0.2 percentage point from the target NAIRU's (see the table). The econometric projections were then used to evaluate the long-term projections for 2000.

Historical and Projected Unemployment Rates for the United States and States

	Average unemployment rate for 1958–93	Observed unemployment rate for 1990	"Target" non-accelerating inflation rate of unemployment for 2000	Projected unemployment rate for 2000
United States	**6.1**	**5.5**	**6.0**	**5.9**
Alabama	7.0	6.8	7.3	7.3
Alaska	8.4	6.7	7.2	7.2
Arizona	6.0	5.4	5.9	5.9
Arkansas	6.5	6.9	7.4	7.4
California	7.2	5.6	6.5	6.5
Colorado	5.3	4.9	5.5	5.5
Connecticut	5.6	5.1	5.2	5.1
Delaware	5.7	5.3	5.8	5.8
District of Columbia	5.8	6.5	7.0	7.0
Florida	6.0	6.0	6.5	6.4
Georgia	5.6	5.5	6.0	5.9
Hawaii	5.1	2.8	4.5	4.5
Idaho	6.3	5.9	6.4	6.3
Illinois	6.0	6.2	6.0	5.8
Indiana	6.0	5.3	5.8	5.8
Iowa	4.3	4.2	4.8	4.7
Kansas	4.2	4.4	4.3	4.3
Kentucky	6.5	5.8	6.4	6.3
Louisiana	7.6	6.2	6.8	6.7
Maine	6.4	5.1	5.6	5.6
Maryland	4.9	4.6	5.2	5.1
Massachusetts	5.6	6.0	6.3	6.2
Michigan	7.9	7.5	8.1	7.9
Minnesota	4.9	4.8	5.4	5.4
Mississippi	7.0	7.5	6.9	6.9
Missouri	5.0	5.8	6.3	6.3
Montana	5.9	5.7	6.3	6.2
Nebraska	3.5	2.2	3.7	3.7
Nevada	6.7	4.8	5.7	5.6
New Hampshire	4.3	5.7	5.5	5.5
New Jersey	6.0	5.0	5.5	5.4
New Mexico	6.4	6.2	6.8	6.8
New York	6.2	5.2	5.8	5.7
North Carolina	5.4	4.1	4.6	4.6
North Dakota	4.7	4.1	4.4	4.4
Ohio	6.7	5.7	6.2	6.1
Oklahoma	5.2	5.6	6.1	6.1
Oregon	6.8	5.5	6.1	5.9
Pennsylvania	6.9	5.4	5.9	5.9
Rhode Island	6.3	6.7	6.7	6.6
South Carolina	5.9	4.7	5.3	5.2
South Dakota	3.6	3.8	4.3	4.3
Tennessee	6.2	5.2	5.8	5.7
Texas	5.7	6.2	5.9	5.8
Utah	5.4	4.3	5.0	4.9
Vermont	5.9	4.9	5.4	5.4
Virginia	4.6	4.3	4.8	4.8
Washington	7.4	4.9	6.2	6.2
West Virginia	9.4	8.3	8.8	8.8
Wisconsin	5.0	4.4	4.9	4.9
Wyoming	5.1	5.5	5.1	5.0

1. See U.S. Congress, Congressional Budget Office, *The Economic and Budget Outlook: An Update* (Washington, DC: U.S. Government Printing Office, 1994): 59–62. See also Geoffrey M.B. Tootell, "Restructuring, the NAIRU, and the Phillips Curve," Federal Reserve Bank of Boston, *New England Economic Review* (September/October 1994): 31–44; and Stuart E. Weiner, "New Estimates of the Natural Rate of Unemployment," Federal Reserve Bank of Kansas City, *Economic Review* (Fourth Quarter 1993): 53–69.

Appendix B

Industrial Classifications

The national and State projections of employment and gross state product were prepared for 56 industries, and the national and State projections of earnings were prepared for 14 industries (table 1). These industries are categorized according to the 1987 Standard Industrial Classification (SIC).[1]

Most of the projections of employment and gross state product are presented at the SIC two-digit level of detail. Most of the projections of earnings are presented at the SIC one-digit level of detail.

In addition, each of the 56 industries was classified either as a basic industry or as a nonbasic industry (table 2). The classification is based on the assumption that basic industries depend on interstate demand and that most nonbasic industries depend on local, or State, demand.

However, most basic industries have a local market, and most nonbasic industries have a potential national market, but it is not feasible to classify each industry as part basic and part nonbasic. Therefore, the 56 industries were classified in two steps.

First, the industries were separated into three groups: (1) Basic industries in all States, (2) nonbasic industries in all States, and (3) nonbasic industries in most States and nonbasic industries that were potential basic industries in other States.[2] Second, the potential basic industries in each State were examined to identify which of these industries should be classified as basic industries.

Specifically, most commodity-producing industries were classified as basic industries in all States. In addition, the railroad, pipeline, and water transportation industries were classified as basic industries in all States because these industries provide interstate services. The Federal military group was also classified as a basic industry in all States because it is unrelated to local demand.

1. For a detailed description of each industrial group, see Office of Management and Budget, *Standard Industrial Classification Manual 1987* (Washington, DC: U.S. Government Printing Office, 1987).

2. No industries were classified as basic industries in most States and as potential nonbasic industries in others.

Table 1.—Industries for the Projections

Industries	1987 SIC code
Farm	01, 02
Agricultural services, forestry, fishing, and other[1]	07–09
Mining	
Metal mining	10
Coal mining	12
Oil and gas extraction	13
Nonmetallic minerals, except fuels	14
Construction	15–17
Manufacturing	
Durable goods	
Lumber and wood products	24
Furniture and fixtures	25
Stone, clay, and glass products	32
Primary metal industries	33
Fabricated metal products	34
Industrial machinery and equipment	35
Electronic and other electric equipment	36
Motor vehicles and equipment	371
Other transportation equipment	37 (except 371)
Instruments and related products	38
Miscellaneous manufacturing industries	39
Nondurable goods	
Food and kindred products	20
Tobacco products	21
Textile mill products	22
Apparel and other textile products	23
Paper and allied products	26
Printing and publishing	27
Chemicals and allied products	28
Petroleum and coal products	29
Rubber and miscellaneous plastics products	30
Leather and leather products	31
Transportation and public utilities	
Railroad transportation	40
Local and interurban passenger transit	41
Trucking and warehousing	42
Water transportation	44
Transportation by air	45
Pipelines, except natural gas	46
Transportation services	47
Communications	48
Electric, gas, and sanitary services	49
Wholesale trade	50, 51
Retail trade	52–59
Finance, insurance, and real estate	
Banks, credit agencies, and investment services	60–62, 67
Insurance	63, 64
Real estate	65
Services	
Hotels and other lodging places	70
Personal services	72
Business and miscellaneous repair services	73, 76
Auto repair, services, and parking	75
Amusement and recreation services and motion pictures	78, 79
Health services	80
Legal services	81
Educational services	82
Social services and membership organizations	83, 86
Private households	88
Other services	84, 87, 89
Government and government enterprises	
Federal, civilian	
Federal, military	
State and local	

1. "Other" refers to U.S. residents employed by international organizations and foreign embassies and consulates in the United States.

NOTE.—The 14 industries for which earnings are projected consist of farm; agricultural services, forestry, fishing, and other; mining; construction; durable goods manufacturing; nondurable goods manufacturing; the transportation and public utilities group; wholesale trade; retail trade; the finance, insurance, and real estate group; services; Federal civilian government; Federal military government; and State and local government.

SIC Standard Industrial Classification

Construction, private households, and State and local government were classified as nonbasic industries in all States. This classification is based on the assumption that variations by State in the level of economic activity for each of these industries reflect variations in local demand.

Potential basic industries were analyzed in terms of employment location quotients in 1993. To be

Table 2.—Classification of Basic and Nonbasic Industries

Industry	Classification	Average employment location quotient (LQ)	Coefficient of variation for employment location quotient	Number of States in which the industry was classified as basic [1]
Farm	Basic			51
Agricultural services, forestry, fishing, and other	Basic			51
Mining:				
Metal mining	Basic			51
Coal mining	Basic			51
Oil and gas extraction	Basic			51
Nonmetallic minerals, except fuels	Basic if LQ exceeds 1.50	1.48	1.62	13
Construction	Nonbasic			0
Manufacturing:				
Durable goods:				
Lumber and wood products	Basic			51
Furniture and fixtures	Basic			51
Stone, clay, and glass products	Basic			51
Primary metal industries	Basic			51
Fabricated metal products	Basic			51
Industrial machinery and equipment	Basic			51
Electronic and other electric equipment	Basic			51
Motor vehicles and equipment	Basic			51
Other transportation equipment	Basic			51
Instruments and related products	Basic			51
Miscellaneous manufacturing industries	Basic			51
Nondurable goods:				
Food and kindred products	Basic if LQ exceeds 1.15	1.10	.64	16
Tobacco products	Basic			51
Textile mill products	Basic			51
Apparel and other textile products	Basic			51
Paper and allied products	Basic			51
Printing and publishing	Basic if LQ exceeds 1.20	.91	.35	13
Chemicals and allied products	Basic			51
Petroleum and coal products	Basic			51
Rubber and miscellaneous plastics products	Basic			51
Leather and leather products	Basic			51
Transportation and public utilities:				
Railroad transportation	Basic			51
Local and interurban passenger transit	Basic if LQ exceeds 1.30	.99	.63	10
Trucking and warehousing	Basic if LQ exceeds 1.12	1.04	.32	22
Water transportation	Basic			51
Transportation by air	Basic if LQ exceeds 1.20	.89	.86	14
Pipelines, except natural gas	Basic			51
Transportation services	Basic if LQ exceeds 1.20	.87	.49	8
Communications	Basic if LQ exceeds 1.15	.94	.26	10
Electric, gas, and sanitary services	Basic if LQ exceeds 1.15	1.08	.30	15
Wholesale trade	Basic if LQ exceeds 1.10	.92	.21	6
Retail trade	Basic if LQ exceeds 1.10	1.01	.11	4
Finance, insurance, and real estate:				
Banks, credit agencies, and investment services	Basic if LQ exceeds 1.10	.92	.34	9
Insurance	Basic if LQ exceeds 1.10	.93	.34	11
Real estate	Basic if LQ exceeds 1.15	.93	.25	11
Services:				
Hotels and other lodging places	Basic if LQ exceeds 1.25	1.35	1.56	16
Personal services	Basic if LQ exceeds 1.05	.97	.12	3
Business and miscellaneous repair services	Basic if LQ exceeds 1.10	.90	.19	5
Auto repair, services, and parking	Basic if LQ exceeds 1.15	.98	.15	10
Amusement and recreation services and motion pictures	Basic if LQ exceeds 1.15	.95	.29	8
Health services	Basic if LQ exceeds 1.25	.97	.21	3
Legal services	Basic if LQ exceeds 1.15	.94	.60	7
Educational services	Basic if LQ exceeds 1.20	.97	.59	9
Social services and membership organizations	Basic if LQ exceeds 1.20	1.01	.26	8
Private households	Nonbasic			0
Other services	Basic if LQ exceeds 1.20	.93	.36	8
Government and government enterprises:				
Federal, civilian	Basic if LQ exceeds 1.15	1.26	1.40	15
Federal, military	Basic			51
State and local	Nonbasic			0

1. Includes District of Columbia.

LQ Location quotient

NOTE.—The employment location quotient for an industry is the ratio of the industry's share of State total employment to that industry's share of national total employment. Data for employment location quotients are for 1993.

classified as a basic industry, a potential basic industry should have a location quotient substantially greater than unity (the "normal" level for a nonbasic industry).

The location quotient of each potential basic industry was analyzed in two steps. First, the location quotients for all potential basic industries in all States in 1993 were arrayed from largest to smallest, and a "cutoff" level was specified. Second, if the values of the industry's location quotient in a State in 1993 exceeded the cutoff level, then the industry was classified as a basic industry in that State. If the location quotient was below the cutoff level, then the industry was classified as a nonbasic industry.

The cutoff levels for location quotients in table 2 differ mainly because of differences in average location quotients, in coefficients of variation for location quotients, or in both.